

tained in two years time.

In no way could I account for the black mass of weevils in the isolated mass on the lawn; they had not been seen travelling there—they just appeared there.

The second instance occurred in the home of an airman who had been in a rented house for about six months; a steady trickle of granary weevils was issuing from under the quarter-round in the hall upstairs and slowly crawling southwards down the hall; they had been emerging for two days before I inspected the house. Again I examined the basement with greatest

care; there was no sign of grain anywhere and the floors and walls were sound and without cracks; moreover there was no place in the garden where anybody could have kept poultry. In this case, I could not even suggest the breeding place of the weevils and recommended the continuous use of the vacuum cleaner for their removal; there was no place to apply insecticides; the wall extended only to the floor below and not to the basement: there was no indication how any material for breeding could have been introduced into the wall from which the beetles were issuing.

A NOTE ON ENGINE VACUUM FOR ASPIRATING INSECTS¹

W. H. A. WILDE²

Studies on vectors of stone fruit virus diseases often require test insects in large numbers. Usually these are Homoptera such as leafhoppers, psyllids, spittle bugs or aphids. Various methods have been devised (1) for aspirating large numbers of these. In my previous collecting with conventional mouth aspirators, minute particles of sand, plant and animal matter had appeared in the sputum, indicating that there was risk of permanent damage from irritation or myiasis (2). This note describes a well-proved method using part of the vacuum of 18 to 20 inches of mercury, available in most truck and car engines. The method differs in details from that of Moore (3) for collecting grasshoppers.

For vehicles with vacuum-operated windshield wipers, cut the wiper vacuum hose under the dashboard, insert a $\frac{3}{8}$ in. brass T-shaped connection into the two cut ends, and attach an aspirator supply hose to the third outlet. The aspirator supply hose should be long enough to come through, or up to the level of, the dashboard to which it is attached for easy connection with the aspirator tubing.

For vehicles with electrically-operated wipers, bore a hole in the intake manifold below the carburetor for a source of vacuum. Thread the hole and insert a stop cock with a $\frac{3}{8}$ in. hose connection for the vacuum line which is then taken through the fire wall to the interior of the vehicle and attached to the dashboard. This takes about 4 ft. of $\frac{3}{8}$ in. windshield wiper hose. By inserting extra T-shaped connections more than one aspirator may be used from the vacuum line.

Window screens of 32/in. mesh should be used. The screens are not absolutely necessary, but the temperature on a hot, sunny day in a closed cab is often fatal to the insects and always uncomfortable for the operator. Connect a conventional straight aspirator (1) to the aspirator tubing. Start the motor and set it to run at medium idling speed. Attach the vacuum gauge to the nozzle of the aspirator and adjust for the required vacuum with a Hoffman clamp on the tubing close to the aspirator. For leafhoppers 2½ to 4 in. of vacuum is required, for spittle bugs 3 to 6 in.

Even where it is not possible to drive a vehicle close to the collecting site, time can still be saved by sweeping with 3 or 4 conventional nets, then returning to the vehicle to aspirate the catch. Release the catch inside

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the vehicle with the doors closed and aspirate the desired insects from the windshield, doors and screens. When 50 to 100 insects are in the aspirator, transfer them to a collecting jar. This avoids damage from swirling particles in the air stream or from the insects piling up. The transfer is easily made from a straight aspirator into a preserving jar, if the jar lid has a self-closing valve made from a piece of inner tube rubber. Shut off the vac-

uum by pinching the aspirator tubing, insert the nozzle of the aspirator in the jar and tap the aspirator gently to dislodge the insects. Shutting off the vacuum in this way does not interfere with the vacuum setting.

Leafhoppers collected with this method showed a better rate of survival in vector studies than those taken by conventional methods, probably because it was easy to select undamaged specimens.

References

1. Peterson, A. 1953. A manual of entomological techniques. 7th Ed. Pl. 68. Edwards Bros. Inc., Ann Arbor, Mich.
2. Hurd, P. D. 1954. "Myiasis" resulting from the use of the aspirator method in the collection of insects. *Science* 119:(3101):814.
3. Moore, H. W. 1943. A mechanical aspirator for sorting and counting insects in the field. *Can. Ent.* 75: 162.

A COLLECTION OF HYMENOPTERA FROM BRITISH COLUMBIA

By JOHN STAINER

This collection consists of species taken during the summer of 1939, at Okanagan Mission, with a few species collected at Vancouver Island points. I am indebted to Dr. R. Lambert, C. D. Miller, W. R. Mason, and G. S. Walley of the Division of Entomology, Ottawa, for their identifications; and to Prof. G. J. Spencer for his help with this paper. Most of the specimens are now in the National Collection at Ottawa, the remainder in my own collection in Parksville.

Of the 50 species listed 11 are not recorded from B.C. in the "Synoptic Catalogue of the Hymenoptera of America North of Mexico" (U.S. Dept. of Agriculture, April 1951). Some interesting points arise in geographical distribution. Of the Apoidea collected only 1 species has a continent-wide range; the ranges of 6 straddle the Rockies; and 23 are recorded West of the Rockies only. On the other hand of the other superfamilies 14 species have a continent-wide range, 3 more have ranges which straddle the Rockies; and only 3 are restricted to the West side of the Rockies. This follows a pattern evident in the Synoptic Catalogue, shown by these figures:

Per cent of American species with ranges which cross the Rockies

Genus <i>Andrena</i>	2.5
Genus <i>Dasymutilla</i>	11.2
Genus <i>Chrysis</i>	34.0

In the following list the specimens were taken at Okanagan Mission in 1939, unless otherwise indicated. Months of capture are given in Roman figures.

TENTHREDINOIDEA

Cimbicidae

Cimbex americana pacifica Cress. ♂ Parksville: 10. viii. 54.

Tenthredo varipictus Nort. ♀ Shawnigan Lake:—V. 54.

ICHNEUMONOIDEA

Ichneumonidae

Pimplinae

Xorides cincticornis Cress. Nanaimo:—viii. 52.

Ichneumoninae

Cratichneumon unifasciatus Say. Parksville:—viii. 53. and 10. ix. 53.

CHRYSIDOIDEA

Chrysididae

Hedychridium fletcheri Bod. 24. v. Nearest previously recorded range: Alta., Ida., Ore. *Chrysis (Chrysurus) pacifica* Say. 5. v. and 22. v.

C. (C.) tota Aaron. 30. iv. Nearest previously recorded range: Ida., Colo.

C. (Chrysis) coeruleans Fab. Nanaimo: 12. viii. 56. 23.v.